

**United States Environmental Protection Agency (U.S. EPA) Science Advisory Board (SAB)**  
**Quality Review Teleconference**  
**January 19, 2011**

**Summary Minutes**

**Date and Time**            January 19, 2010, 12:00 noon - 3:00 p.m. Eastern Time

**Location:**                By teleconference

**Purpose:**                To conduct a quality review of two draft SAB reports, 1) *Advisory on EPA's Draft Report on Aquatic Ecosystem Effects of Mountaintop Mining and Valley Fill*<sup>1</sup>, and 2) *Review of Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams*<sup>2</sup>

**Meeting Participants:**

SAB Members

Dr. Deborah Swackhamer, Chair  
Dr. Claudia Benitez-Nelson  
Dr. Ingrid Burke  
Dr. Terry Daniel  
Dr. Costel Denson  
Dr. Otto C. Doering, III  
Dr. David Dzombak  
Dr. Bernd Kahn  
Dr. Agnes Kane  
Dr. Nancy Kim  
Dr. Kai Lee  
Dr. Cecil Lue-Hing  
Dr. Lee D. McMullen  
Dr. James R. Mihelcic  
Dr. Christine Moe  
Dr. Horace Moo-Young  
Dr. Eileen Murphy  
Dr. Duncan Patten

Dr. Stephen Roberts  
Dr. Amanda Rodewald  
Dr. James Sanders  
Dr. Kathleen Segerson  
Dr. John Vena  
Dr. Robert Watts  
Dr. Thomas Zoeller

Liaison Members

Dr. James Johnson  
(EPA's National Advisory Council for Environmental Policy and Technology)

## **Other Participants:**

### SAB Staff Office

Thomas Armitage, Designated Federal Officer (DFO)

### EPA

Jeff Frithsen, EPA Office of Research and Development

Matt Klasen, EPA Office of Water

Michael Slimak, EPA Office of Research and Development

Mary Anne Strasser, EPA Office of the Inspector General

### Other

Karen Bennett, National Mining Association

Thomas Casey, Alabama Coal Association

Nick Juliano, Inside EPA

Alan Kovski, BNA

Christy M. Mower, CONSOL Energy Inc.

Jennifer L. Smith, Hunton and Williams, LLP

## **Teleconference Summary:**

### **Convene the meeting**

Dr. Thomas Armitage, SAB DFO, convened the advisory meeting and welcomed the group. He noted that one request had been received to provide oral public comments and that three sets of written public comments had been received for the Board's consideration. He noted that the meeting materials were available on the SAB Web site (these materials include: the Federal Register notice announcing the meeting<sup>3</sup>, meeting agenda<sup>4</sup>, written public comments<sup>5</sup>, and SAB members' preliminary quality review comments<sup>6</sup>).

### **Purpose of meeting and review of the agenda**

Dr. Deborah Swackhamer, the SAB Chair, welcomed SAB members and reviewed the purpose of the meeting. She stated that on the call the chartered SAB would conduct quality reviews of two draft reports of the SAB Panel on Ecological Impacts of Mountaintop Mining and Valley Fills. She indicated that the Board would first review the Panel's report on Aquatic Ecosystem Effects of Mountaintop Mining and then review the report on the Field-Based Aquatic Life Benchmark for Conductivity. She reminded SAB members that quality reviews focus on four questions:

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?
2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?
3. Is the Committee's report clear and logical?

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

## **Public Comments**

Dr. Swackhamer introduced Karen Bennett of the National Mining Association who had requested time to present public comments.

Ms. Bennett commented that the National Mining Association (NMA) had previously submitted written comments to the SAB Mountaintop Mining Panel. Those comments identified concerns about EPA's draft Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams. She indicated that the comments had been resubmitted for the consideration of the chartered SAB. Ms. Bennett then summarized the key areas of concern identified in NMA's written comments.

## **Overview of the draft Report on Aquatic Ecosystem Effects of Mountaintop Mining**

Dr. Duncan Patten, Chair of the SAB Panel on Ecological Impacts of Mountaintop Mining and Valley Fills thanked the chartered SAB members for their comments on the draft report on Aquatic Ecosystem Effects of Mountaintop Mining. He provided an overview of the report. He indicated that the Panel had been asked to review a draft EPA document assessing the state of the science regarding ecological impacts of mountaintop mining and valley fill operations on streams in the Central Appalachian Coal Basin. He noted that the Panel had been asked to comment on: EPA's conceptual model; literature review; and analyses concerning loss of headwater streams, downstream water quality and stream biota, cumulative ecological impacts, and the effectiveness of restoration methods. Dr. Patten summarized the responses to EPA's six charge questions as presented in the executive summary of the Panel's report.

## **Chartered SAB Discussion of the draft Report on Aquatic Effects of Mountaintop Mining**

Dr. Swackhamer identified the lead reviewers to begin the SAB discussion. She noted that all of the lead reviewers had provided written comments; however, Dr. John Giesy was not able to be on the call. She indicated that she would summarize Dr. Giesy's comments.

Dr. Claudia Benitez-Nelson highlighted her written comments. She indicated that the Panel's report was comprehensive and contained detailed and constructive comments addressing the six charge questions. She provided a number of suggestions to improve the clarity of the report. She noted that there had been no attempt in the SAB review to develop a revised conceptual diagram clearly indicating the revisions requested by the Panel. She noted that this would have been very helpful. She noted that the SAB Panel had provided more than 100 missing references in an appendix to its report and she recommended that the missing literature be referenced within the main body of the SAB review. Dr. Benitez-Nelson also noted that in some of the Panel's recommendations it was not possible to understand whether the Panel was indicating that: 1) data were missing from EPA's report, 2) data were missing from EPA's report and needed to be reinterpreted, or 3) data were unavailable but should be obtained in future

research efforts. In addition, Dr. Benitez-Nelson commented that it would be helpful to edit parts of the report to make some of the statements more concise.

Dr. Amanda Rodewald commented that, overall, the Panel had done an excellent job responding to the charge questions. She highlighted key points in her written comments. She recommended that the report further emphasize the importance of considering how impacts to terrestrial systems can affect aquatic ecosystems. She noted that the Panel's report contained some comments concerning the importance of terrestrial systems but she recommended that these comments be strengthened. She recommended that the report elaborate on the importance and diversity of taxa impacted by mountaintop mining and valley fills. She noted that it would be helpful to further discuss advances in mine reclamation processes that allow reforestation. She also noted that, given EPA's interest in ecosystem services, the report should recommend that the expected impacts from mountaintop mining and valley fills be considered in the context of ecosystem services.

Dr. James Sanders indicated that the report was quite clear and had addressed all of the charge questions. He recommended that EPA's conceptual model figure be included in the response to the charge question concerning the conceptual model. He noted that, without having that figure as a reference, it was somewhat difficult to understand some parts of the Panel's recommendations.

Dr. Swackhamer summarized Dr. John Giesy's written comments. Dr. Swackhamer noted that Dr. Giesy had found the report to be comprehensive and well organized. He had provided a number of editorial suggestions.

Dr. Patten then responded to the SAB lead reviewers' comments. He commented that the Panel had not developed a revised conceptual model diagram because this would have required much time and was somewhat beyond the scope the Panel's work. He commented that the Panel could include a figure of EPA's conceptual model in the report. However, he was not sure this was necessary to effectively communicate the recommendations to those who had developed the model. With regard to missing references in the report, he suggested that in appropriate places the report could indicate that new references had been provided. He noted that it would be helpful to receive specific examples indicating how to clarify the Panel's recommendations concerning missing data. He agreed that it was important to emphasize how impacts to terrestrial systems could affect aquatic ecosystems, and also indicated that the concept of ecosystem services could be discussed in the report. He noted that Dr. Giesy's editorial comments could be addressed.

Dr. Benitez-Nelson responded that the text on pages 34-39 of the draft report was an example of where it would be useful to include the clarifying changes she had discussed. She noted that other SAB members had also suggested clarifying the missing data recommendations. In addition, she indicated that, if the Panel did not revise EPA's conceptual model diagram, the original conceptual model figure should be included in the report to clarify the Panel's recommendations.

Dr. Swackhamer asked Dr. Patten if he objected to including EPA's conceptual diagram figure in the report. He responded that the figure could be included but he did not want to indicate that the Panel was endorsing the diagram. Dr. Sanders noted that the diagram was large and complex and could be pulled apart into subcompartments. Dr. Swackhamer indicated that it would be helpful to include EPA's original conceptual model diagram in the report. Dr. Rodewald suggested that ecosystem services could be addressed in the response to charge question five.

Dr. Swackhamer then asked other chartered SAB members for comments. A member noted that exposure to dust and airborne toxics were potential human health risks and that this should be considered in the report. Dr. Patten responded that this was an important issue but the report did not address human health issues. Dr. Swackhamer indicated that the report should explicitly state that it did not address human health issues. Two members requested specific revisions in the response to charge question six. A member indicated that there was a need to clarify statements concerning restoration methods, and another member commented that the report should address the impact of introducing invasive species after restoration. Another member expressed agreement with Dr. Benitez Nelson's comments and recommended that the report be improved by effectively indicating which recommendations could be accomplished through revision of the current EPA assessment, and which recommendations would require additional analysis of literature and data or conducting new research. Dr. Swackhamer asked Dr. Patten to review and revise the report to address members' comments.

Dr. Swackhamer asked whether members had additional comments. There were no further comments so Dr. Swackhamer asked for a motion on disposal of the report. She noted that the Board's quality review could result in: 1) approval of the report either as is or subject to editorial changes and review by the Chair, 2) approval of the report subject to re-review by designated Board members, or 3) return of the draft report to the authoring panel or committee for further work so that a revised report may be brought before the Board for a second quality review. A member moved that the report be approved subject to the changes discussed and re-review by the lead reviewers. The motion was seconded. The Chair asked for a voice vote to approve the motion and the motion carried.

Dr. Swackhamer then stated that the Board would next review the Panel's report on the Field-Based Aquatic Life Benchmark for Conductivity and asked Dr. Patten to provide an overview of that report.

### **Overview of the draft Report on the Field-Based Aquatic Life Benchmark for Conductivity**

Dr. Patten indicated that the Panel had been asked to review a draft EPA report that derived an aquatic life benchmark to protect native genera in Appalachian streams exposed to mountaintop mining and valley fills. The Panel's charge questions focused on: the adequacy of the data sets used to develop the conductivity benchmark, whether the methodology was clearly explained, whether the report effectively described the causal relationship between species extirpation and high levels of conductivity, whether the report considered factors that may confound the relationship between conductivity and extirpation of invertebrates, whether the

Panel agreed with the approach used to evaluate uncertainty in the benchmark value, whether the benchmark provided a degree of protection comparable to conventional ambient water quality criteria, the conditions under which the benchmark would be transferable to other regions of the U.S., and issues that should be considered in applying the benchmark to other pollutants. Dr. Patten summarized the Panel's responses to EPA's eight charge questions as presented in the executive summary of the Panel's draft report.

### **Chartered SAB Discussion of the Conductivity Benchmark Report**

Dr. Swackhamer asked the lead reviewers to begin the discussion.

Dr. Claudia Benitez-Nelson indicated that the Panel had provided detailed and constructive recommendations to improve EPA's Conductivity Benchmark Report. She indicated that she had no major comments but summarized several minor comments that she had provided in writing to clarify parts of the report.

Dr. Amanda Rodewald noted that the Panel's report had addressed EPA's charge questions and that she had not found technical errors. She indicated, however, that she had provided some suggestions to clarify the report. She then summarized her written comments. She agreed with the Panel's assessment that a benchmark based on extirpation may not be protective of the stream ecosystem and suggested that the report more clearly state that extirpation was not an appropriate endpoint. She noted the Panel had indicated that genera extirpation was not a chronic response and she commented that this appeared to be inconsistent with the Panel's other statements suggesting that the metric needed to be slightly modified. She expressed concern about the potential loss of genera-rich species. She also commented that the discussion of potential confounding factors and their treatment were critical parts of the report and she suggested that the Panel provide more specific recommendations in this regard.

Dr. James Sanders noted that the Panel had provided thoughtful and constructive responses to EPA's charge questions. He summarized his general comments. He agreed with the Panel's statements indicating that conductivity was a surrogate for constituent ions that are toxic. He noted that the report should more clearly indicate why this surrogate measure could be misused, or had the potential to provide inadequate protection. He recommended that the language in the executive summary and body of the report be reviewed and that more cautionary wording be considered. He suggested that the Panel consider incorporating wording that had been used in its report on the aquatic effects of mountaintop mining and valley fills.

Dr. Swackhamer summarized Dr. Giesy's comments. She noted that Dr. Giesy had found the report to be well written, clear, logical, and responsive to the charge questions. He had suggested that the report address the use of multivariate statistical methods. He had also suggested that the report more clearly indicate that it was unlikely the approach would be successfully applied to determine field-based thresholds for other chemical pollutants. In addition, Dr. Giesy had provided editorial comments.

Dr. Patten responded to the lead reviewers' comments. Dr. Patten agreed that the caveats mentioned by Dr. Giesy could be strengthened in the report. He agreed with reviewing the

confounding factors section of the report to determine whether it could be strengthened. He noted that the report could more clearly indicate that extirpation of genera was not a protective endpoint. He agreed with Dr. Sanders' recommendation to more clearly indicate why the surrogate conductivity measure could be misused, or had the potential to provide inadequate protection.

Dr. Swackhamer suggested that Dr. Patten strengthen the message in the report to address the lead reviewers' comments and revise the letter to the administrator to more clearly communicate the points raised by the lead reviewers.

Dr. Swackhamer then asked whether members had additional comments. A member noted that in the letter to the Administrator it was hard to tell whether the Panel was recommending changes in the approach. She suggested strengthening the letter to more clearly indicate the Panel's recommendations regarding improving EPA's document. Dr. Patten agreed with this suggestion. There was no further discussion so Dr. Swackhamer asked for a motion on disposal of the report.

A member moved that the report be approved subject to the changes discussed and re-review by the lead reviewers. The motion was seconded. The Board briefly discussed the motion. The Chair then asked for a voice vote to approve the motion and the motion carried.

Dr. Swackhamer then thanked Dr. Patten and members of the SAB Panel for their work to develop the two reports. The Designated Federal Office then adjourned the meeting.

Respectfully Submitted:

Certified as True:

*/Signed/*

---

Dr. Thomas Armitage  
SAB DFO

*/Signed/*

---

Dr. Deborah L. Swackhamer  
SAB Chair

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by committee members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters, or reports prepared and transmitted to the EPA Administrator following the public meetings.

The following meeting materials are available on the SAB Web site,  
<http://www.epa.gov/sab>, at the following address:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/ed55af1742315d34852577ec0059aad0!OpenDocument&Date=2011-01-19>

---

<sup>1</sup> Advisory on EPA's Draft Report on Aquatic Ecosystem Effects of Mountaintop Mining and Valley Fills

<sup>2</sup> Review of Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams

<sup>3</sup> Federal Register Notice Announcing the Meeting

<sup>4</sup> Agenda

<sup>5</sup> Written Public Comments from:

David Roberson, Alabama Coal Association

Karen Bennett, National Mining Association

Mike T.W. Carey, Ohio Coal Association

<sup>6</sup> Preliminary Quality Review Comments from Members of the Chartered SAB and Board Liaison Members